

SUPERSTUDIO

DOMESTICATED FOODSCAPES

EPFL Architecture Master
Winter Semester 2023
Forum III
EPFL ENAC EAST

SWEET CORN

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RESEARCH
QUESTION

I. DOMESTICATED
FOODSCAPES
FORUM I

How to rethink the relation between
architecture and food production /
storage ?

Atlas of
typologies

Atlas of
producers

19 / 20.09
The green
house

II. CULTIVATE
FORUM II

How to store sweetcorn and reduce
the waste of all parts during the pro-
cess ?

Storage
device /
prototype

Booklet

17 / 18.10
SG Hall
and field

III. COLLECT
FORUM III

How to preserve the sweetness of
the sweetcorn after harvesting in a
more sustainable way ?

Atlas of
typologies

Atlas of
producers

14 / 15.11
AAC231

IV. DISTIL
FORUM IV

?

?

?

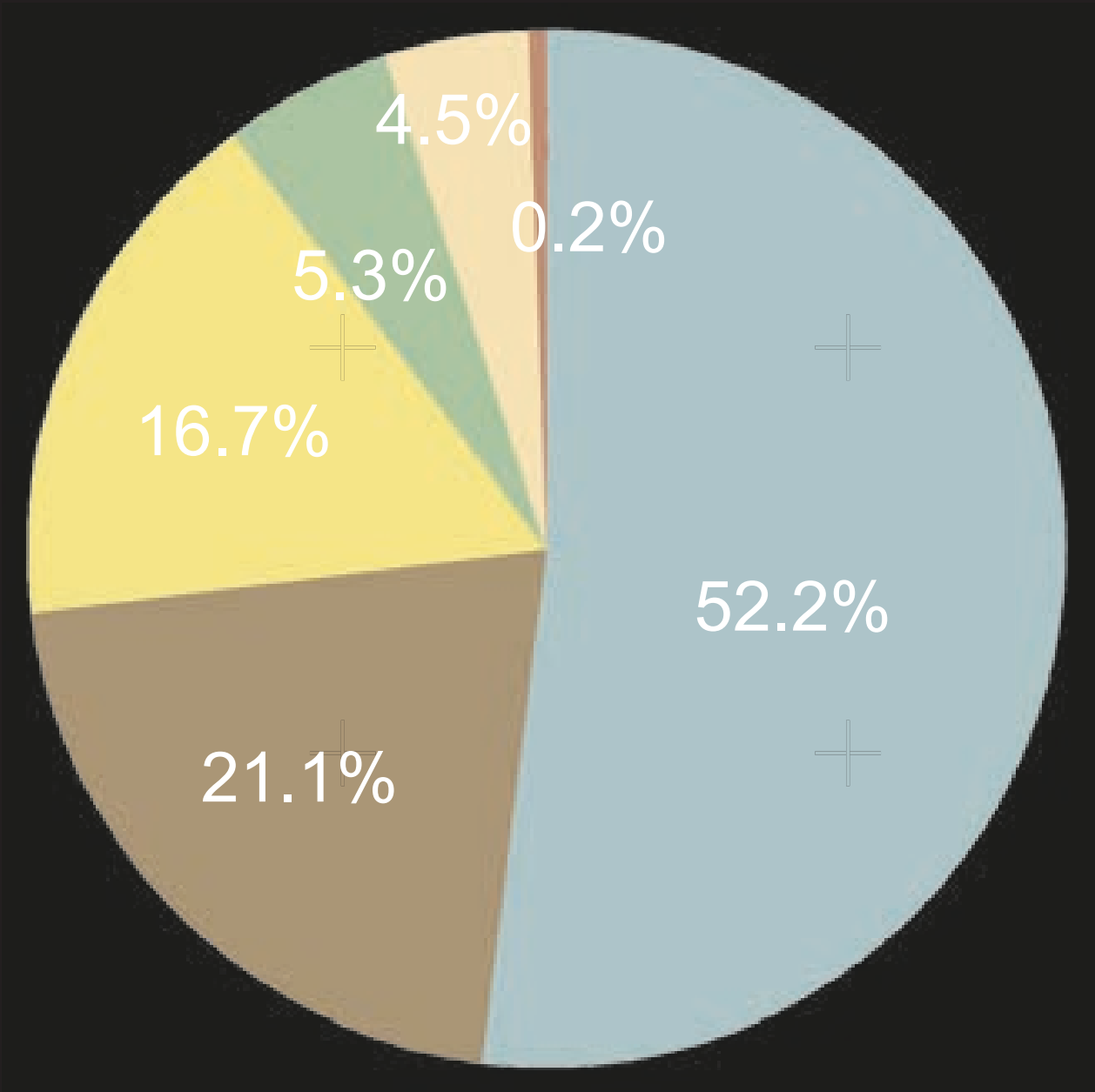
19 / 20.12
The green
house

STATISTICS

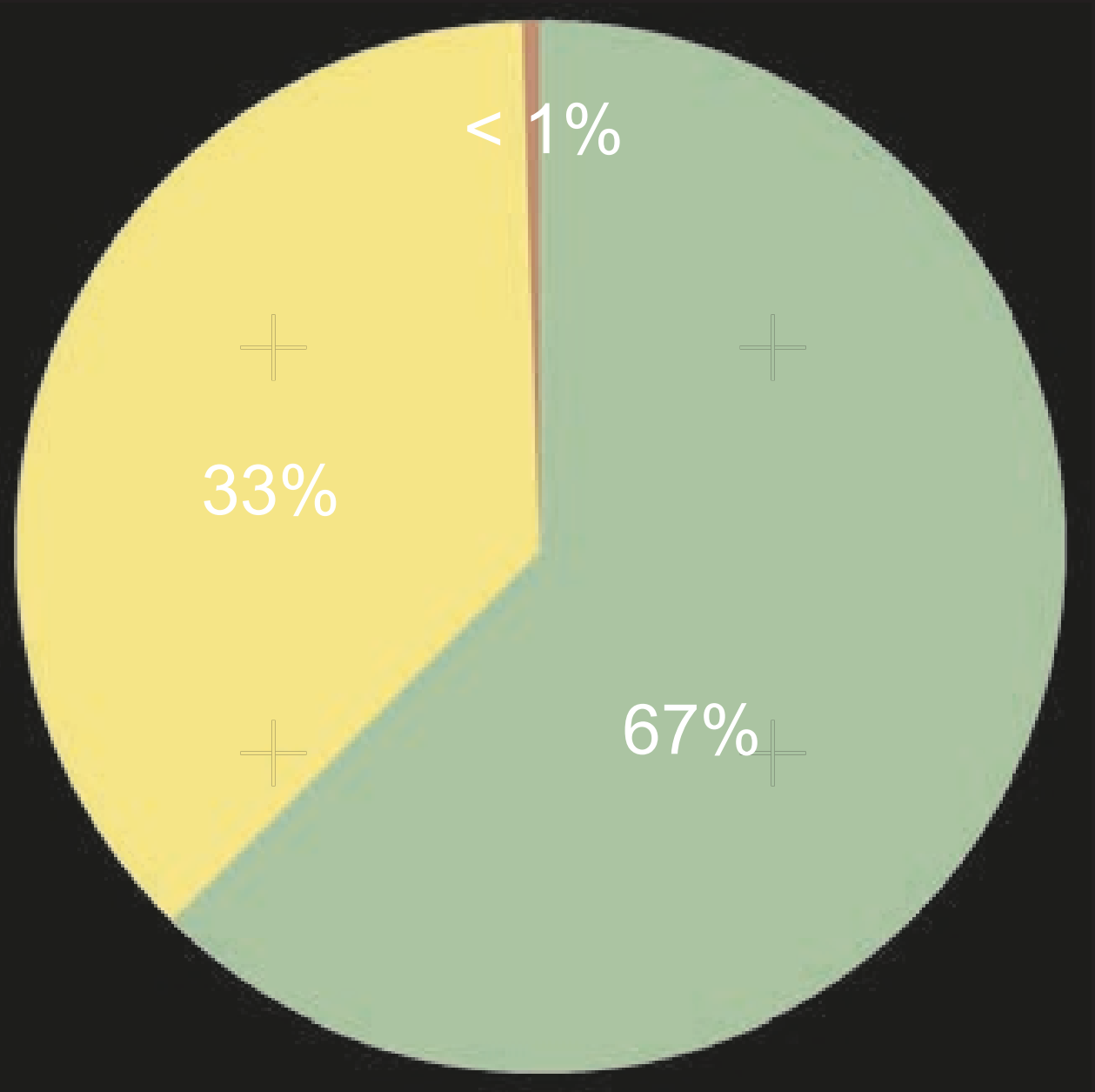
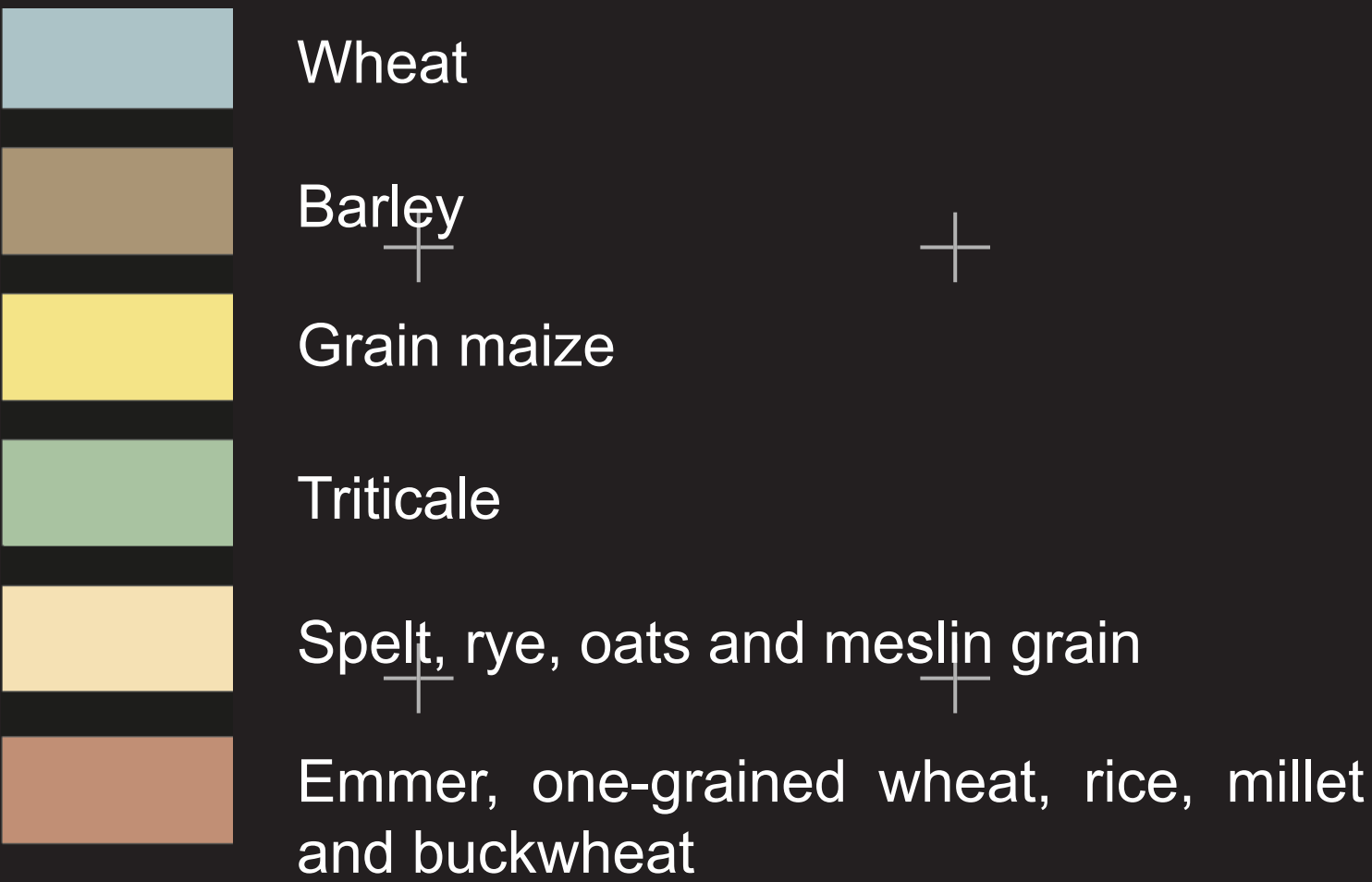
SWITZERLAND

Cereal production in 2017:
975 000 tonnes

Source: SFU - Crop production
© FSO 2019



CEREAL PRODUCTION IN 2017



CORN PRODUCTION



The production of edible maize like sweet corn in Switzerland is very small. It accounts for less than 1 percent of cultivation. The majority of production is forage maize of which one third is grain maize and two thirds is silage maize.

STATISTICS

SWITZERLAND

CLIMATE - CORN GRAIN

© FOAG

- Favorable
- Favorable to suitable
- Suitable
- Unfavorable



SWISS PRODUCTION OF BASIC CORN SEEDS



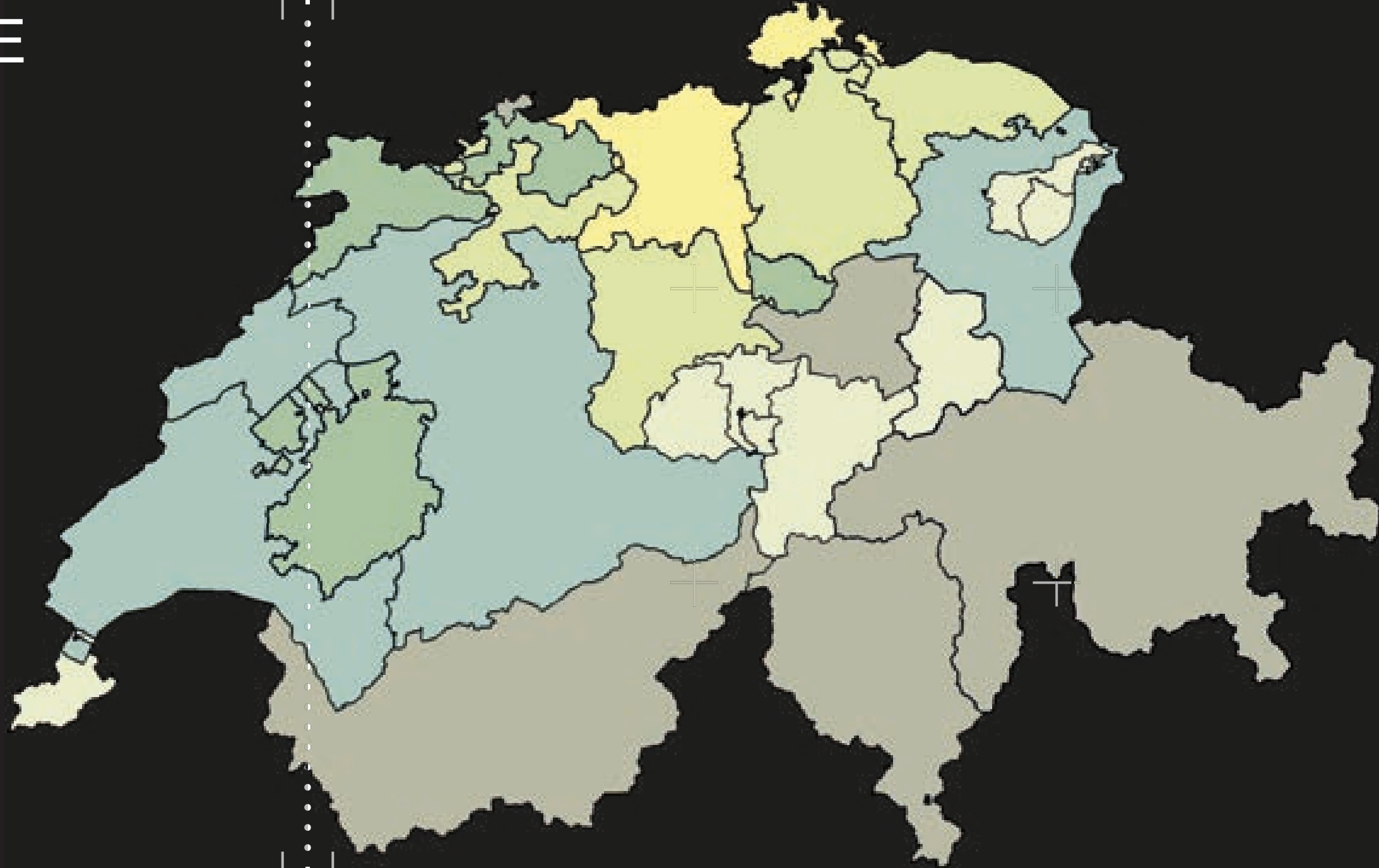
The production of basic corn seeds by breeders through coordination by Swissmais association covers the Swiss demand by only 30%.

SURFACE OF CORN SILAGE AND GREEN CORN IN 2021

(in % of utilised agriculture land)

© FSO, Survey of Agricultural Structures

- 0.2 - 1.0%
- 1.1 - 1.6%
- 2.5 - 4.2%
- 4.8 - 5.7%
- 6.4 - 6.8%
- 7.3 - 8.3%



IDENTITY CARD

SWEETCORN



SWEET CORN

POPCORN

FLOUR CORN

DENT CORN

FLINT CORN

POD CORN

HARVESTING SEASON

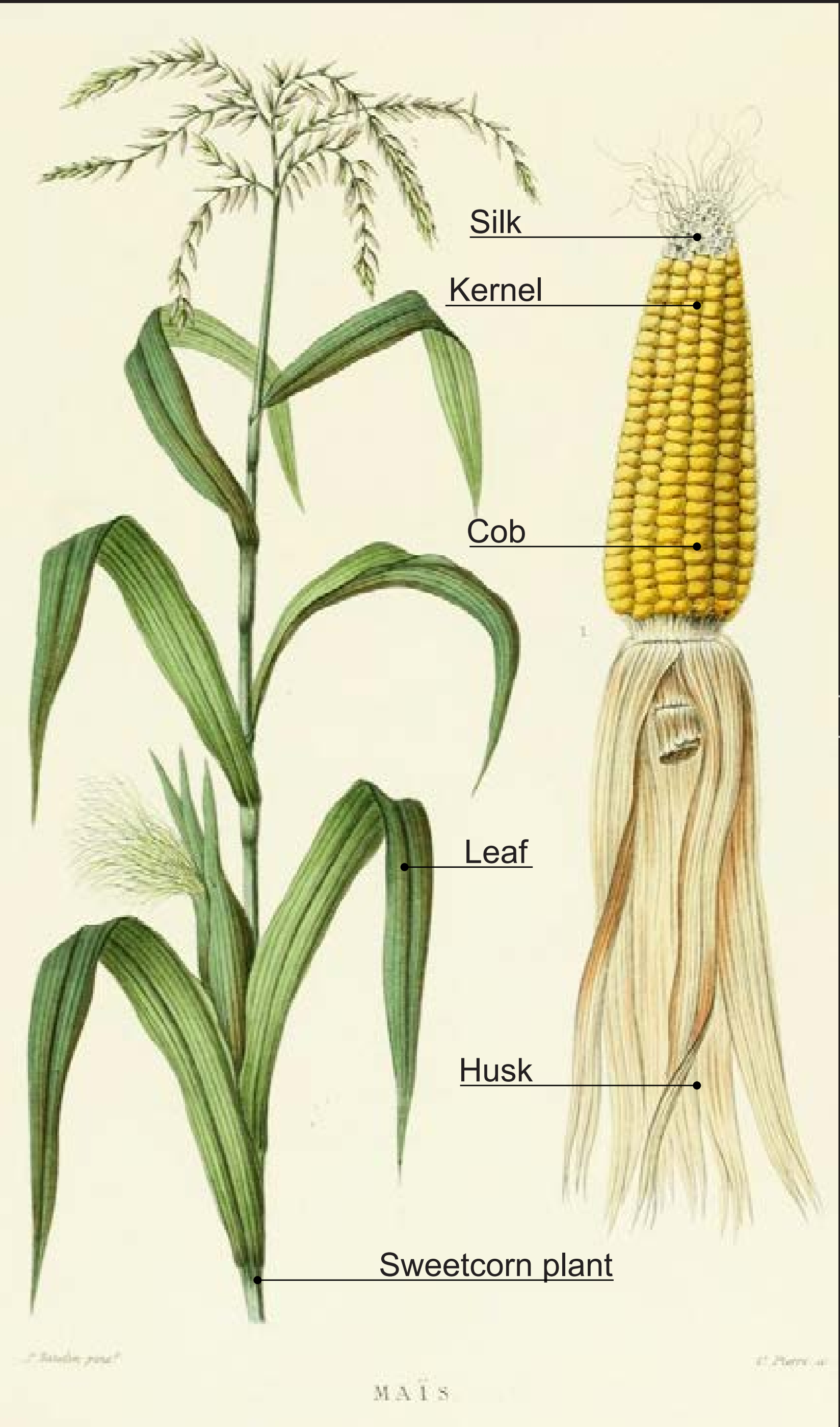


GROWING CONDITIONS REQUIREMENTS

Watering	☒	☐	☐	Low
Light	☒	☒	☒	Sun
Maintenance	☒	☐	☐	Minimal



Sweetcorn is a warm-season crop that thrives in temperatures between 15°C to 35°C. The growth period from planting to harvest typically spans 60 to 100 days, depending on the variety and environmental conditions. At maturity, sweet corn plants typically reach a height of 1.2 to 2.4 m, producing ears of corn that are around 15 to 25 cm in length.



Manager : Contact : 056 622 52 36
Products : Sweetcorn and cooked vegetables
Note : Sweetcorn production in Reuss valley and processing at Fischbach-Göslikon site

PRODUCERS

BEARERS SEED

INTERVIEW

KEY TAKEAWAYS

With Elodie Hess, producer

« On est tellement petit que c'est un marché de niche, donc c'est notre semancier qui nous donne directement les **graines**. Il y a différentes **variétés**. Il y en a qui sont plus pour la couleur, il y en a qui sont plus pour le **rendement**. On a plutôt visé par rapport au **goût** et à la **couleur** typique du maïs doux. »

« We have such a small production, it is a niche market, it is thus our seed breeder who provides us directly the **seeds**. There are different **varieties**. Some of them ensure a nice colouration, some of them ensure a better **yield**. On our part, we choosed based on the **taste** and the **colour** which is distinctive of the sweetcorn. »

« La plante entre le moment où on la plante et où on la récolte, ça prend quand même du **temps à se développer**. Niveau **entretien**, il n'y a **pas grand chose**, si on ne se les fait pas manger. De base c'est un fort demandeur en eau mais où on les a planté, ils n'ont jamais été arrosés. »

« Between the moment that we plant the seeds and the moment that we harvest, **it takes times to develop**. Regarding the **maintenance**, **there isn't a lot to do**, if the plants are not eaten by animals. Commonly, sweetcorn is asking for a lot of watering, but where we planted them, we have never watered them. »

« Avant, dans chaque maison, il y avait un jardin et chacun cultivait ce qu'il pouvait. Au jour d'**aujourd'hui en ville**, je ne vois pas comment ils pourraient **faire un jardin par personne**. Ça prend du temps, et la récolte n'est pas toujours à la hauteur de nos espérances. »

« Before, attached to every house, there was a garden and everyone was cultivating what he could. **Nowadays in urban areas**, I don't imagine how we could **offer a garden per person**. It takes time, and the harvest is not always equal to our hopes. »

« Il y a des gens qui n'achètent pas parce qu'ils ne veulent pas des **OGM**, alors qu'on a beau leur dire que les OGM sont **interdits en Suisse**. Même les graines n'ont pas le droit d'être importées. C'est vraiment que de la **F1** et c'est tout. En tout cas, les gros producteurs ne font pas de maïs doux. »

« There are still people who doesn't buy because they don't want **GMO**, even if we tell them that GMO are **prohibited in Switzerland**. Even the seeds can't be imported from abroad. It is really only **F1** and that's all. In any case, big producers don't make sweetcorn. »

« Je sais qu'au Canada, ils les récoltent avec les feuilles, ils les mettent **sous vide** et ils les mettent au **congélateur** comme ça. Moi je le mets **en conserve** : je l'égraine, je le rince, je mets 2/3 de vinaigre pour 1/3 d'eau. C'est croquant, par contre ça n'a **plus exactement le même goût** que sur l'épis. »

« I know that in Canada, they harvest sweetcorn with the husk, they put it **under vacuum** and they put it into the **freezer** like that. For my part, I process **canning** : I remove the kernels, I rinse them, I put them into 2/3 vinegar and 1/3 water. It's crispy, but it **doesn't have exactly the same taste** that when eated on the cob. »

VISIT PRODUCERS

HESS FARM

FARM / SELF-SERVICE MARKET

Producer : Elodie and Frédéric Hess

Location : Chemin de Longeraie 54,
1052 Le Mont-sur-Lausanne (VD)

Contact : 078 753 05 37

Products : Sweetcorn and various crops

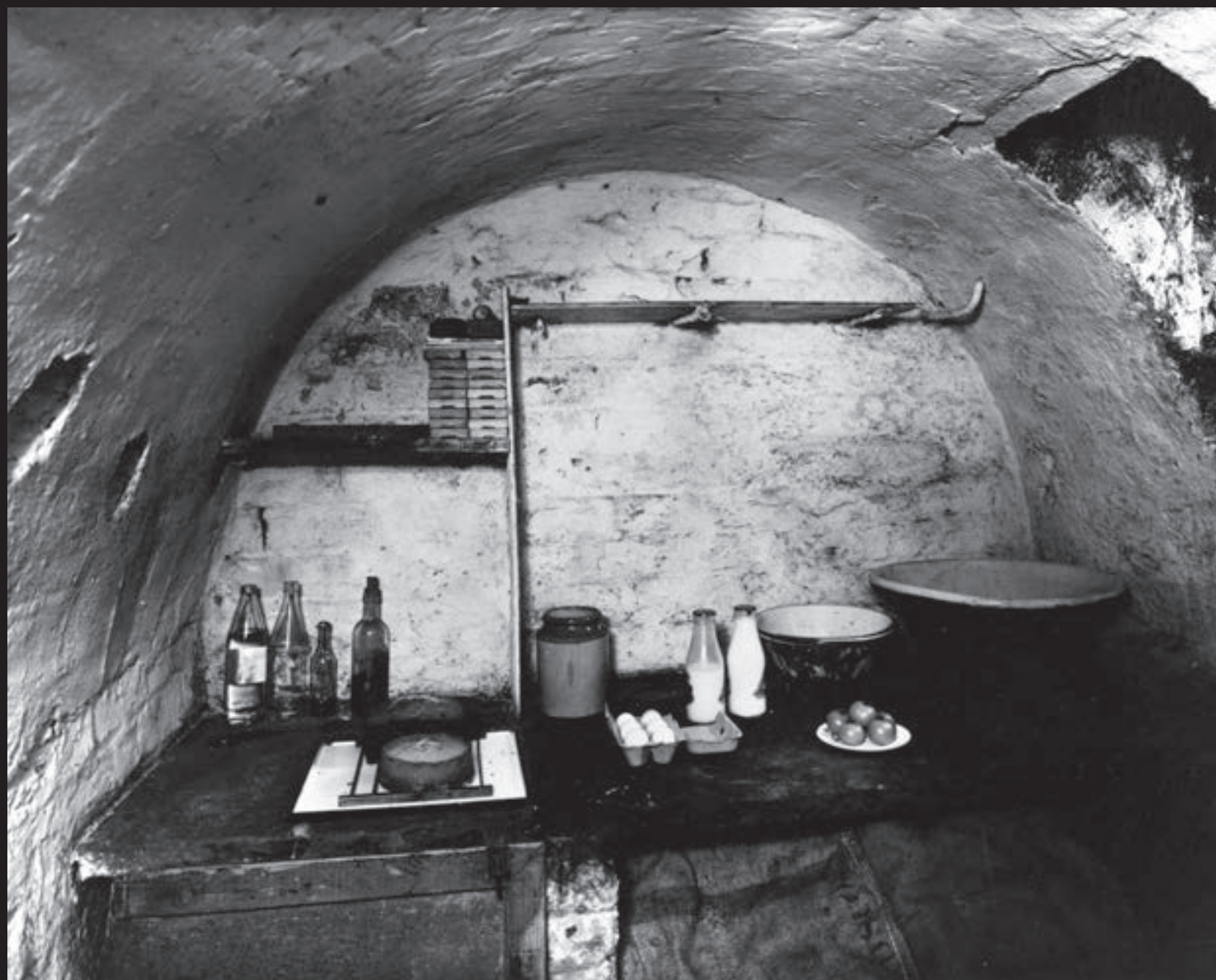


SIGNIFICANT CITATIONS

« Sweetcorn must be cooled when and just after harvesting, so it can be stocked for longer. »

« Sweetcorn should be stored in a cool place, as the sugar in the kernels turns to starch when heated, so the sweetness is lost. »

© Der Schweizer Bauer, Melina Gerhard, *Deshalb ist Schweizer Zuckermais süsser*, 2019.



SYNTHETIC DIAGRAM

Evaporative
cooling

Pot-in-pot (zeer pots)

Evaporative cooler box

Charcoal cooler

STORAGE

*PRESERVE THE
SWEETNESS OF
KERNEL*

CELLAR
STORING

Root cellar

Vault cellar

Zähringen cellar

CANNING

Canning factory

Sweetcorn

Hydrocooling

Flood type

Immersion type

Batch type

*RECYCLE THE
OTHER PARTS*

FREEZING

DRYING

DISTILLING

GRINDING

FERMENTING

PRESSING

Charcoal

Husk tea

Corn silk tea

Cornmeal

Corn starch

Corn flour

Cornmeal

Corn starch

Corn flour

Corn beer

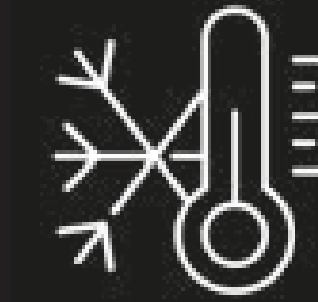
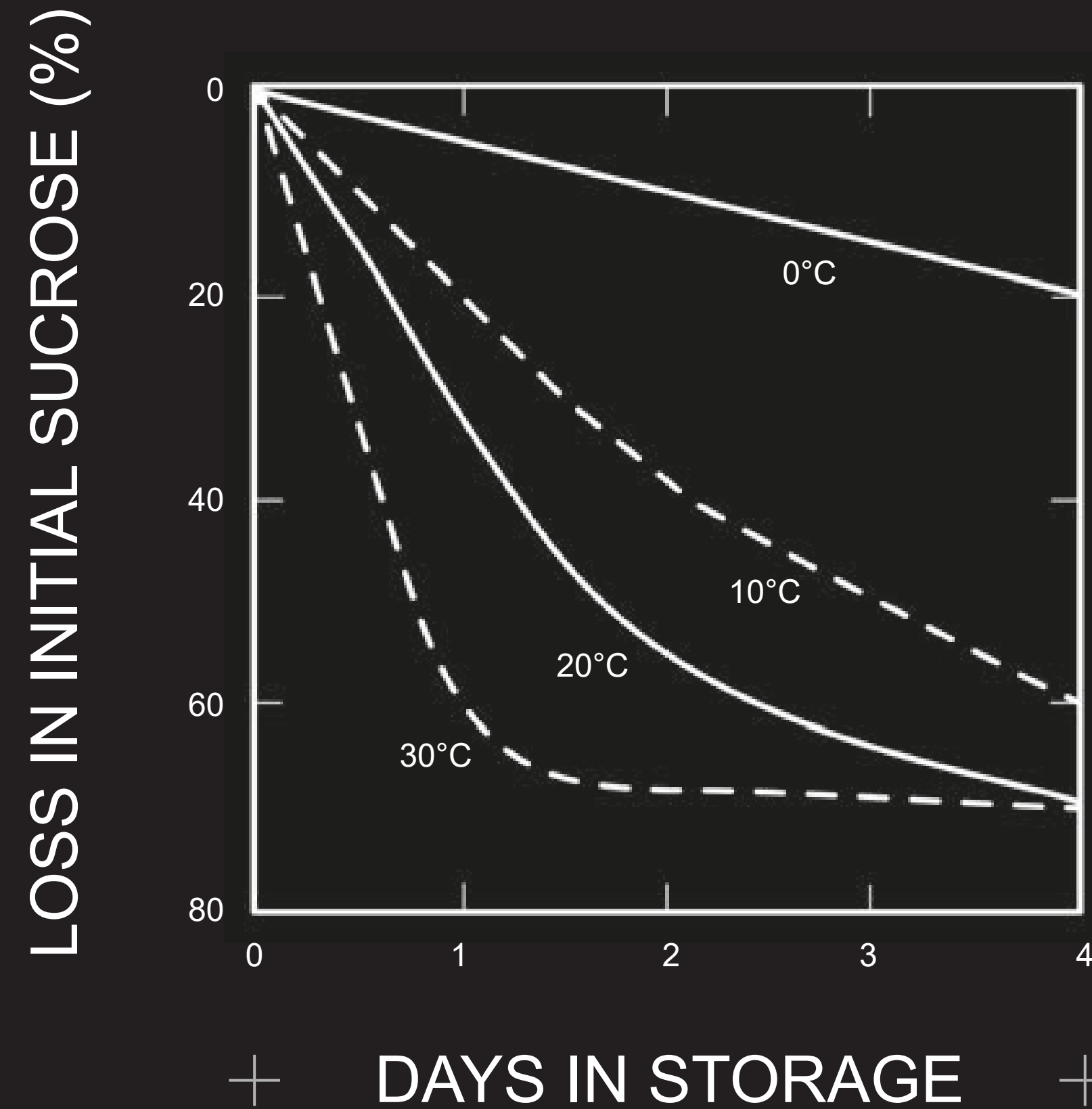
Corn relish

Corn oil

PRE-COOLING

STORAGE CONDITIONS

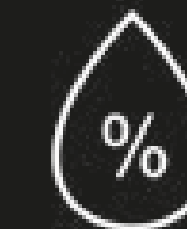
Loss of sugar during storage at four different temperatures



Sweet corn must be continuously and properly refrigerated from harvest until it reaches the consumer.

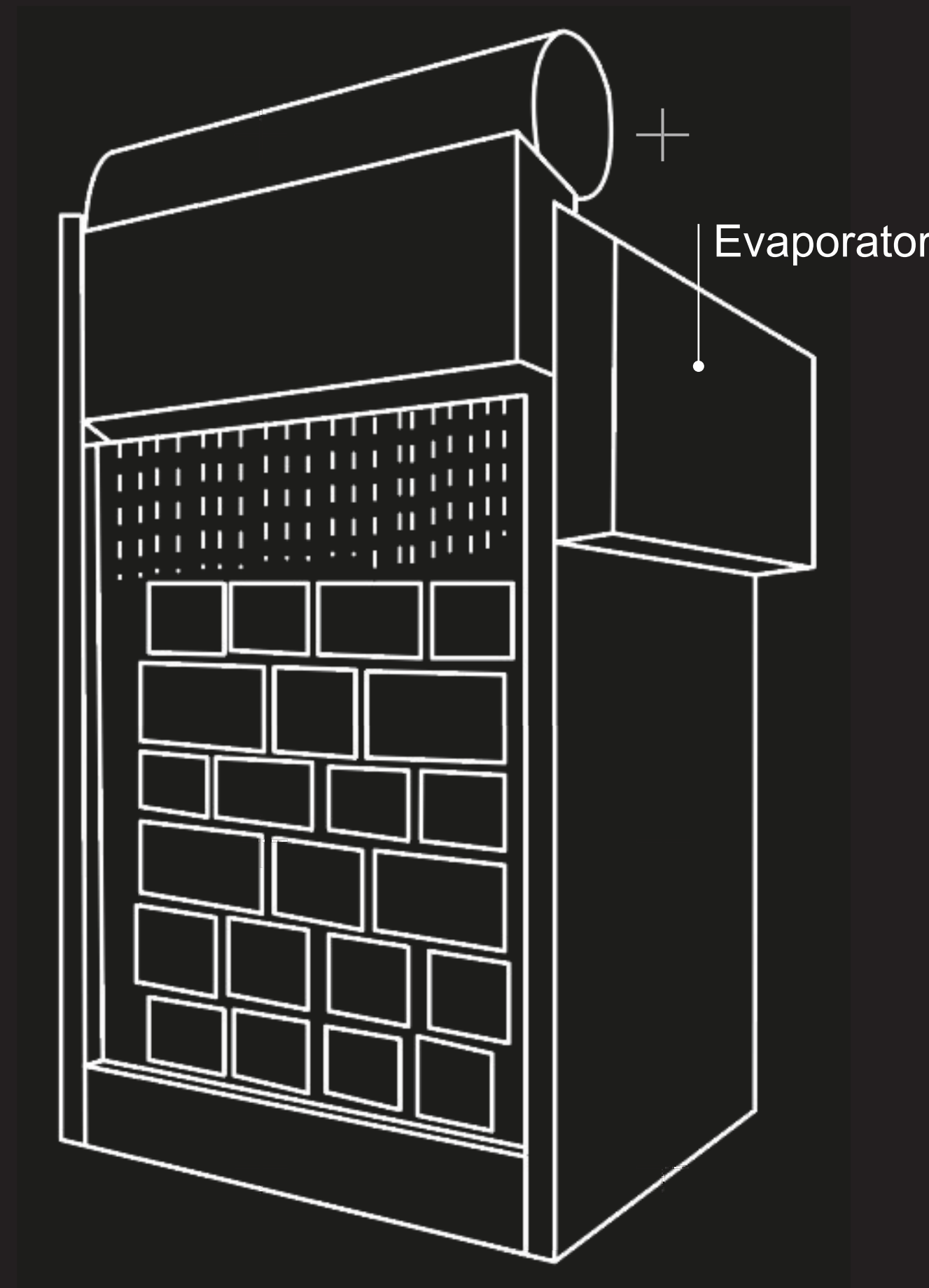
It can be stored with a maximum of 2 weeks including transit time.

It should be stored as cool as possible (0°C to 1°C) without freezing.

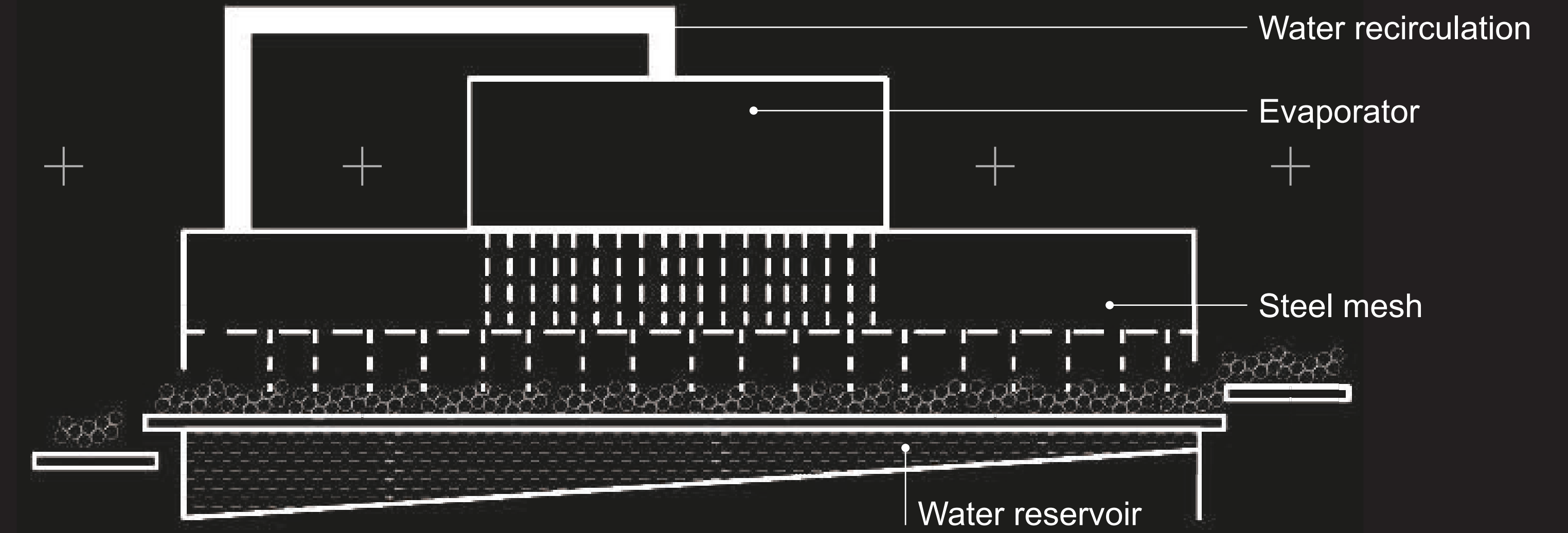


High humidity (95% to 98% relative humidity) helps reduce moisture loss and kernel denting).

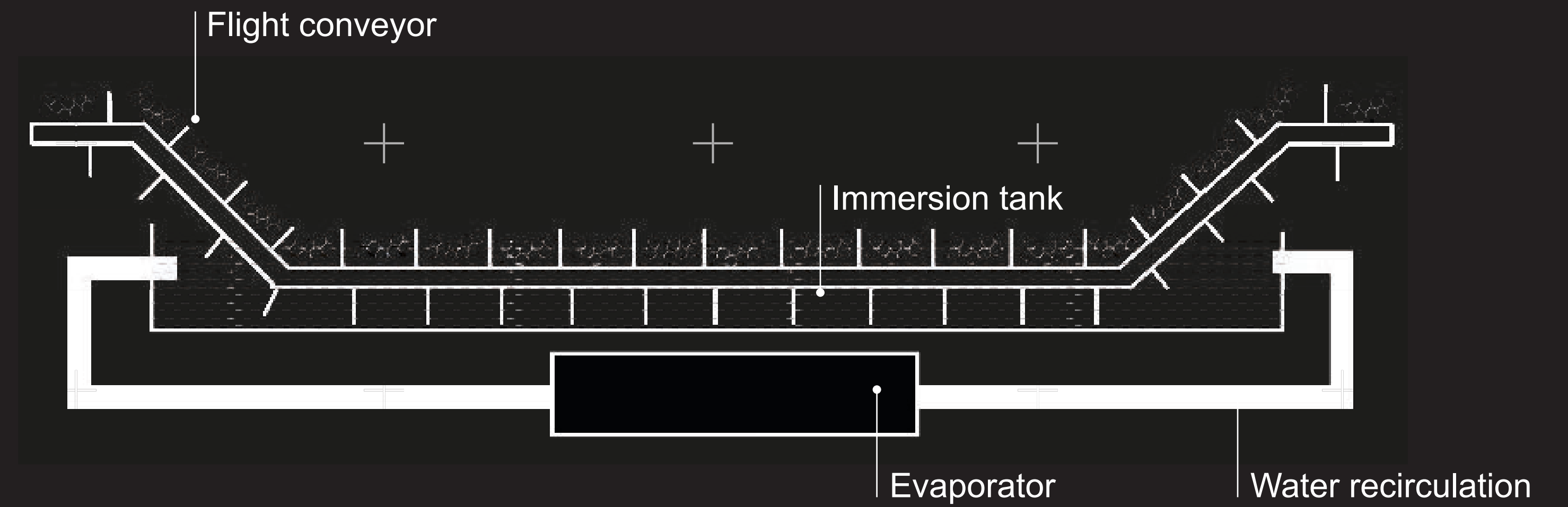
HYDROCOOLING METHODS



BATCH TYPE

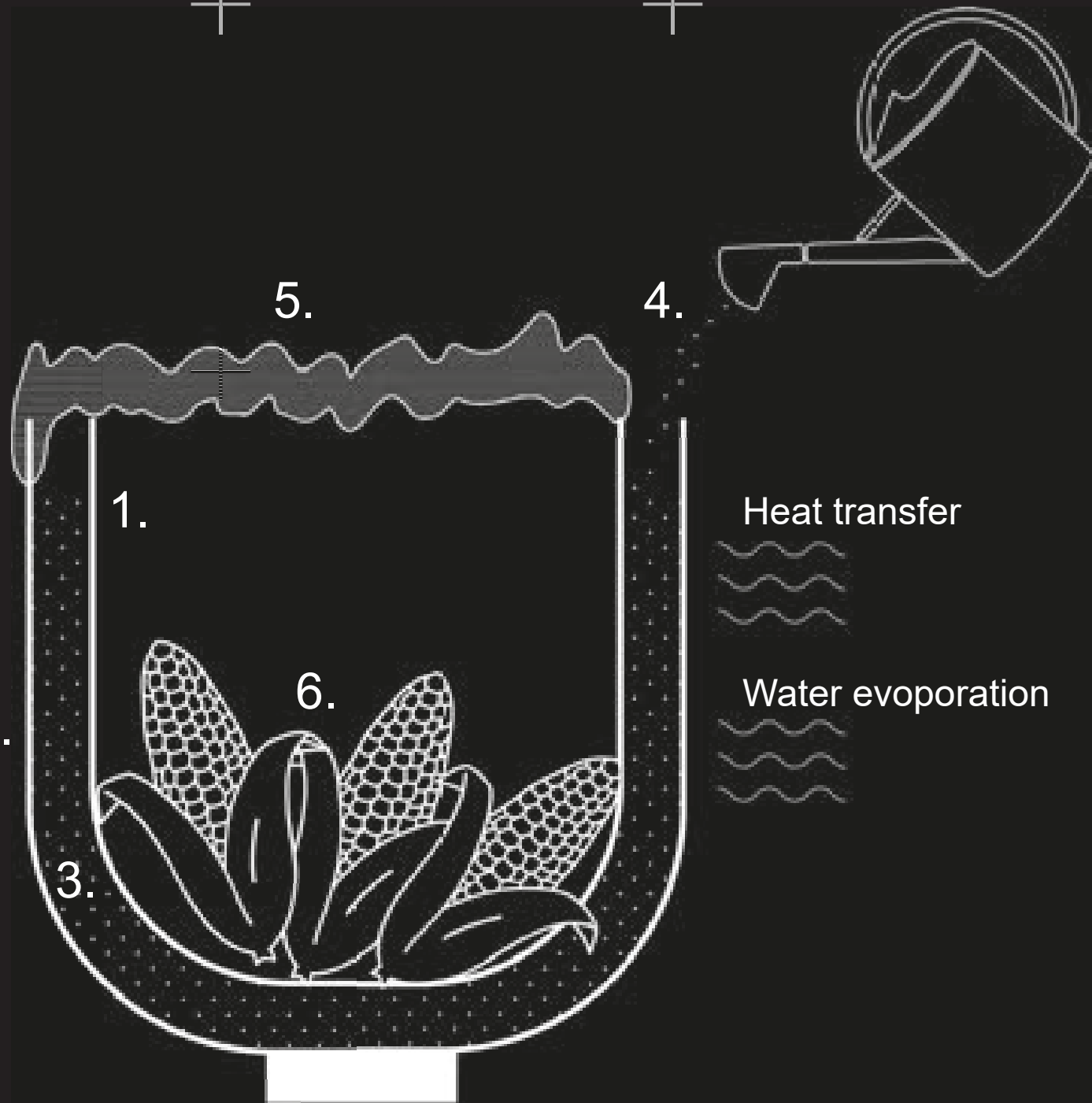


FLOOD TYPE



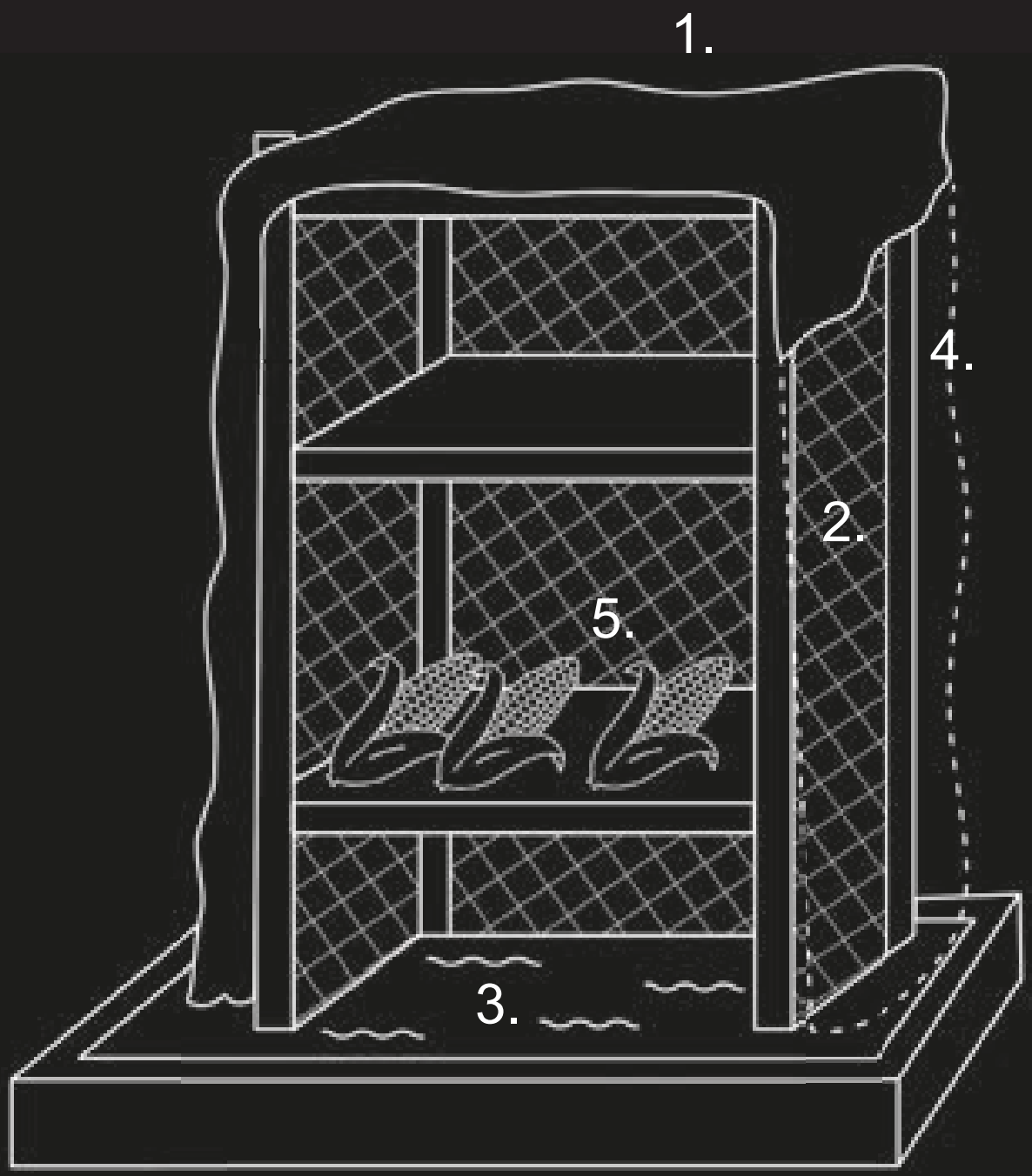
IMMERSION TYPE

EVAPORATIVE COOLING



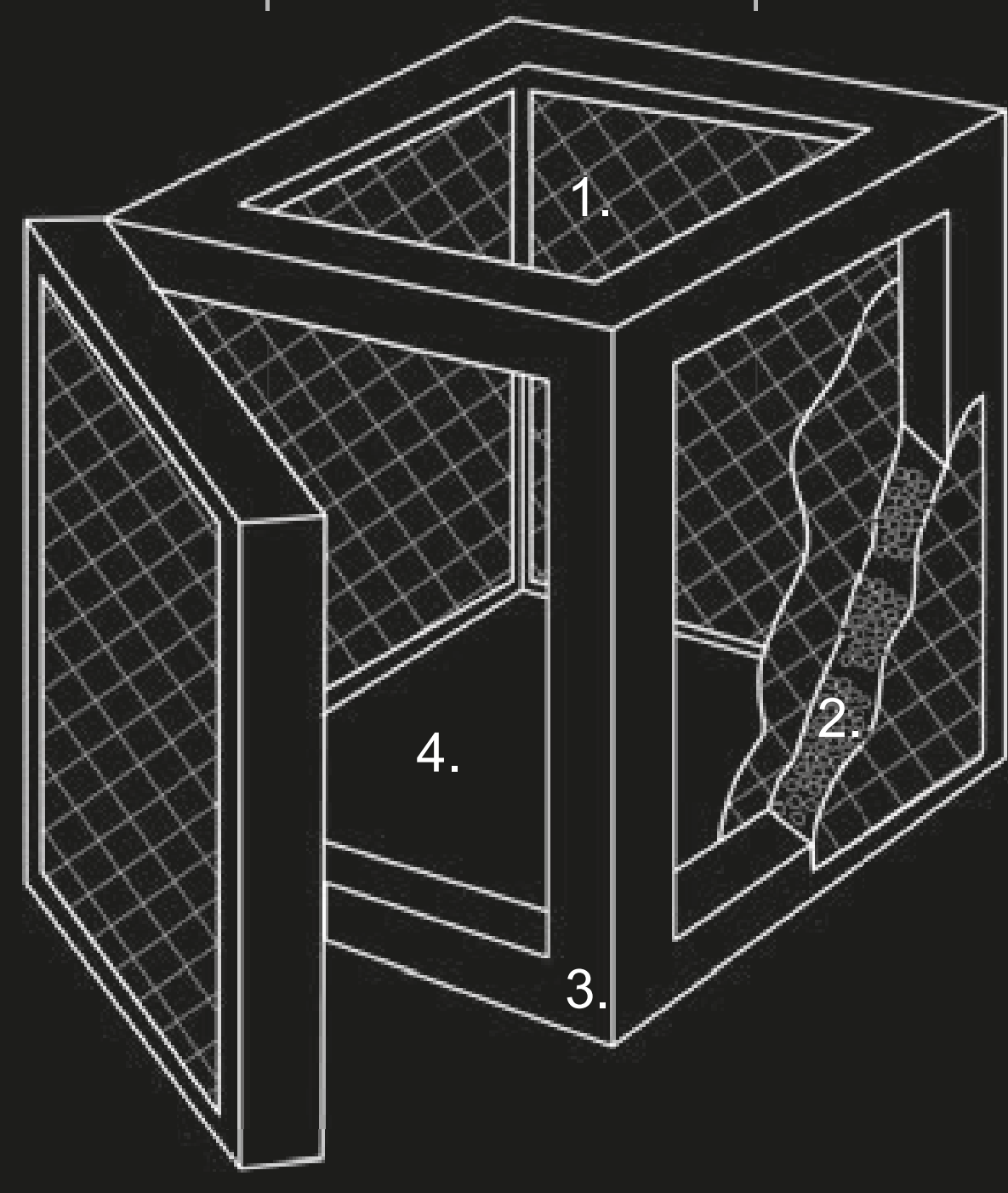
POT-IN-POT (ZEER POTS)

- 1. Inner pot
- 2. Outer clay pot
- 3. Sand
- 4. Water
- 5. Wet cloth
- 6. Stored sweetcorn



EVAPORATIVE COOLER BOX

- 1. Burlap or cloth
- 2. Mesh
- 3. Water
- 4. Structure
- 5. Stored sweetcorn

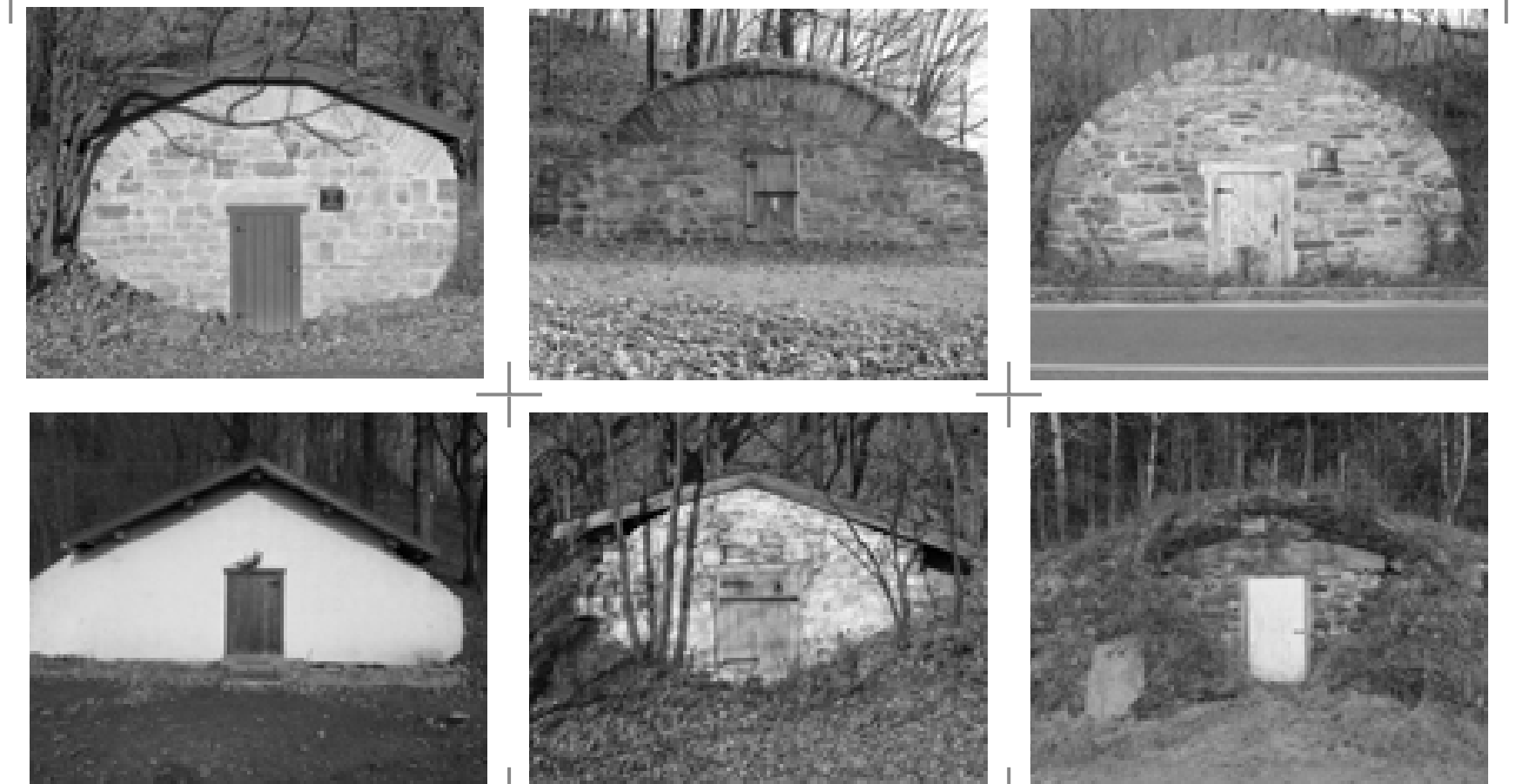


CHARCOAL COOLER

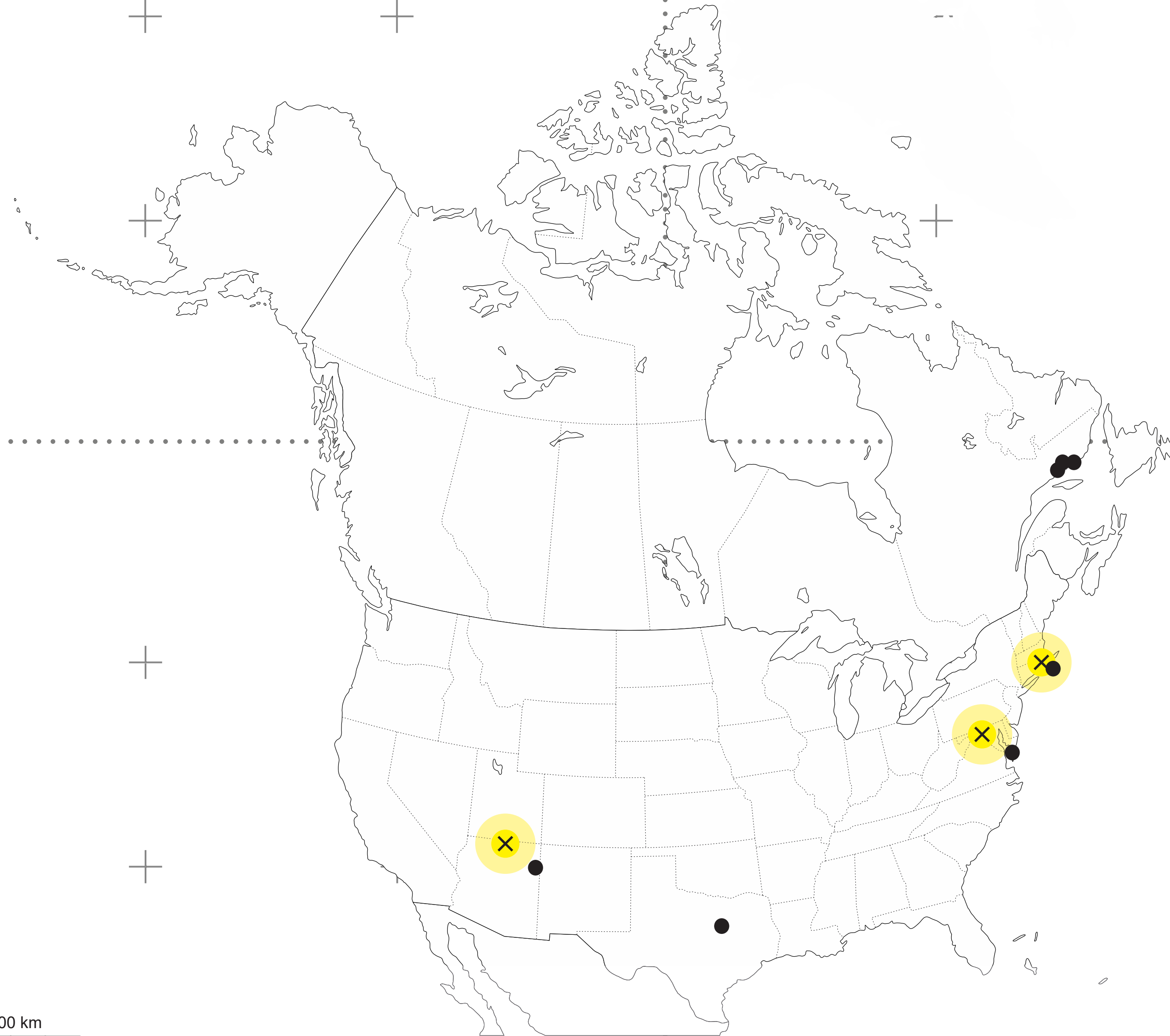
- 1. Mesh
- 2. Charcoal pieces
- 3. Structure
- 4. Stored sweetcorn

TYPOLGY / ROOT CELLAR

CANADA



USA



N

1000 km



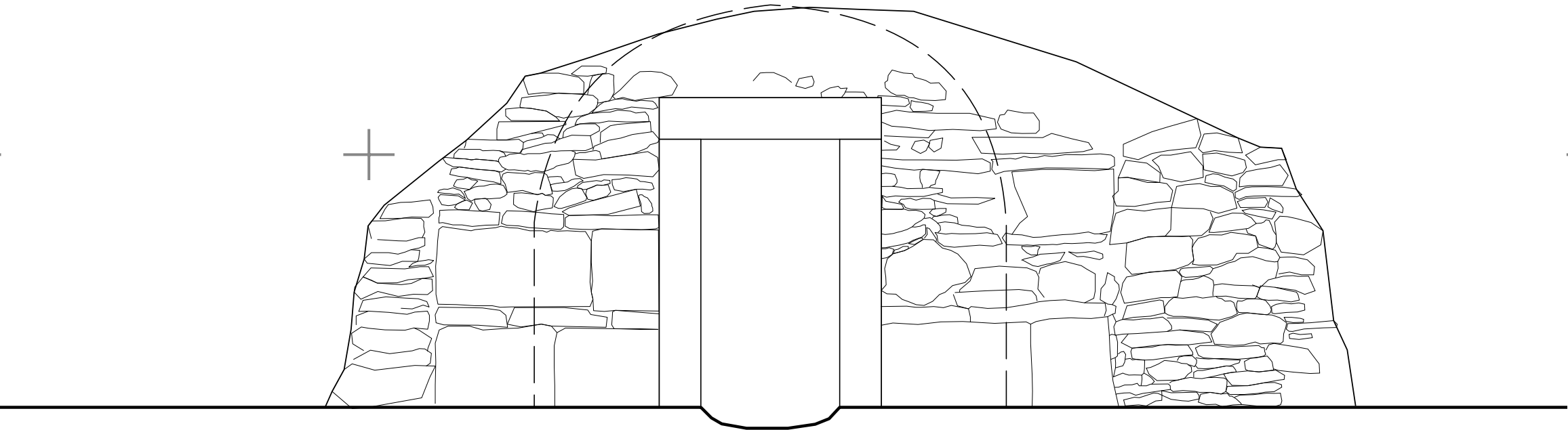
TPOLOGY / ROOT CELLAR

Thompson

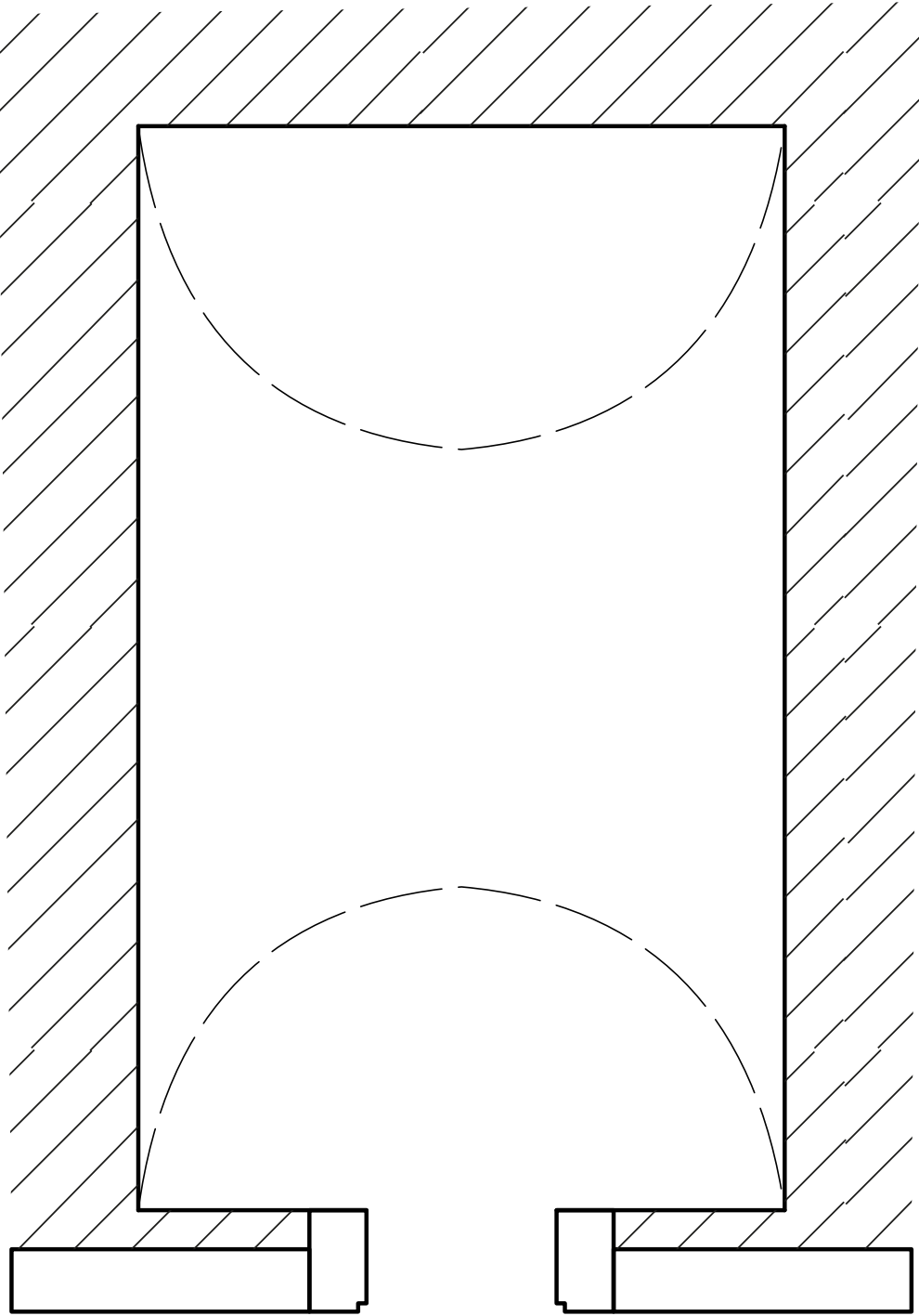
Location N 42° 0.840’
 W 71° 48.143’

Address E. Thompson Road,
 Thompson, Connecticut, USA

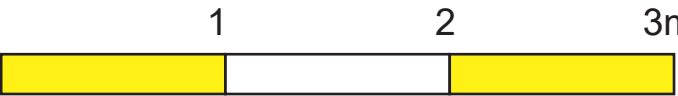
Date 1850-1900



ELEVATION



PLAN



TPOLOGY / ROOT CELLAR

Philip Pry Farm

Location N 39° 27' 01.8"
 W 77° 46' 11.5"

Address Boonboro Pike (State Route 34),
 Sharpsburg, Washington County, USA

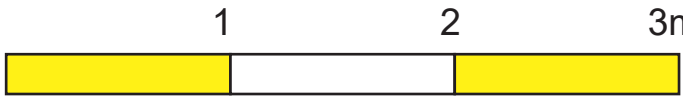
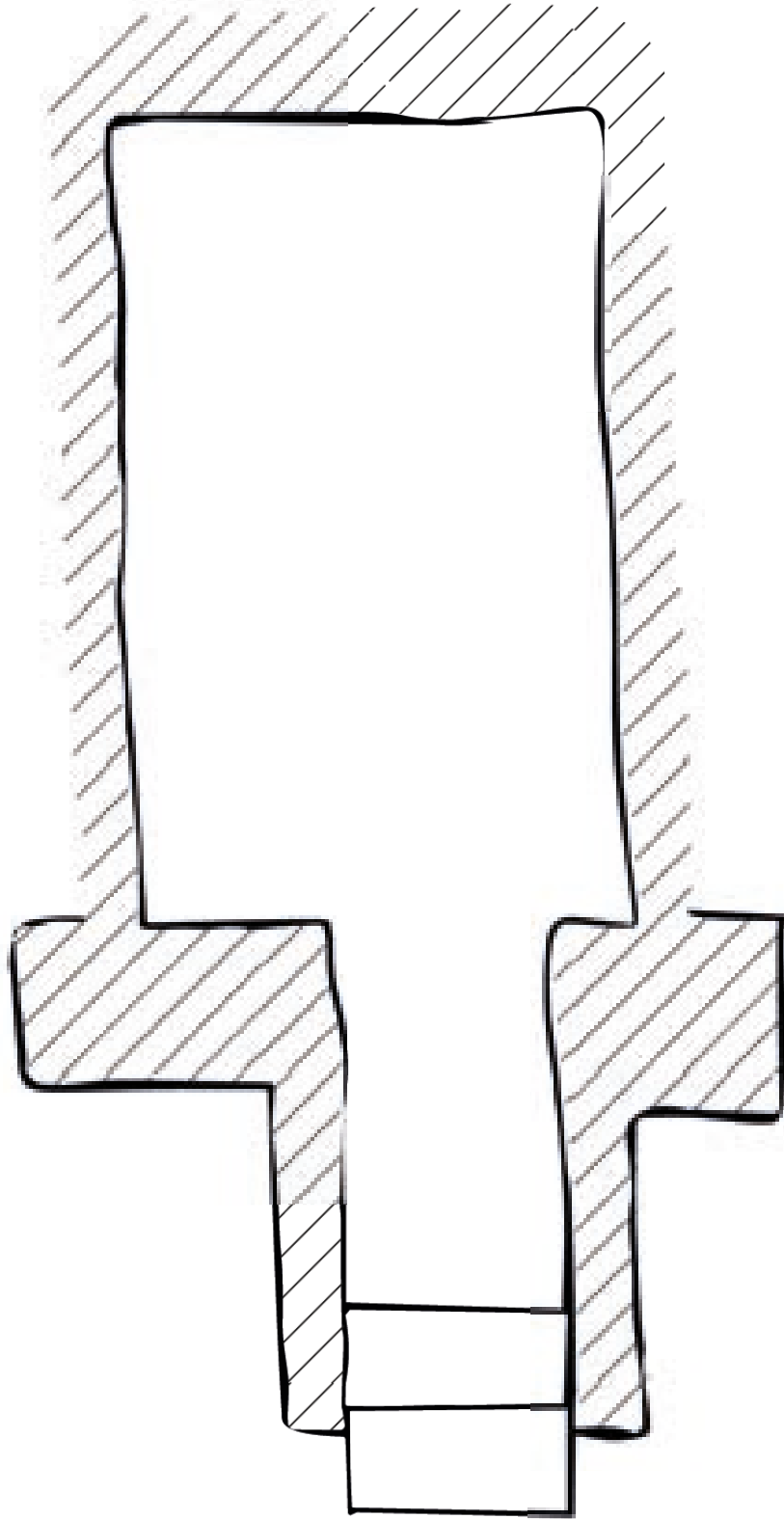
Date 1933-1970



ELEVATION



PLAN



TPOLOGY / ROOT CELLAR

Lee's Ferry

Location N 36° 54' 53.0"
 W 111° 27' 21.0"

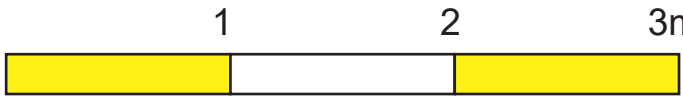
Address U.S. Route Alternate 89,
 Coconino County, USA

Date 1933-1970



ELEVATION

PLAN

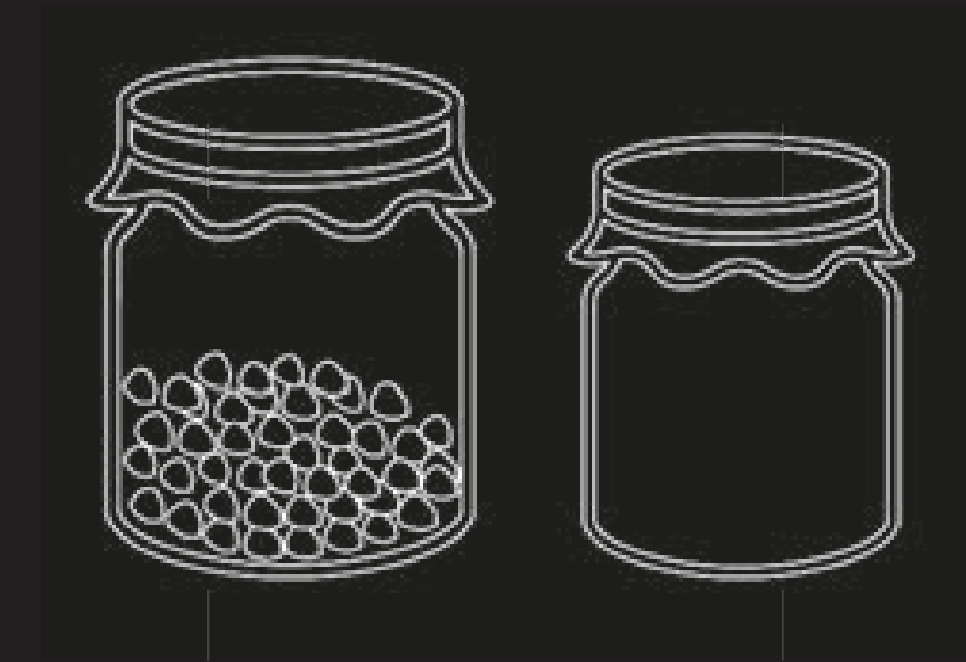


PROCESS WITHOUT ENERGY

How to preserve the sweetness of the sweetcorn after harvesting in a more sustainable way ?



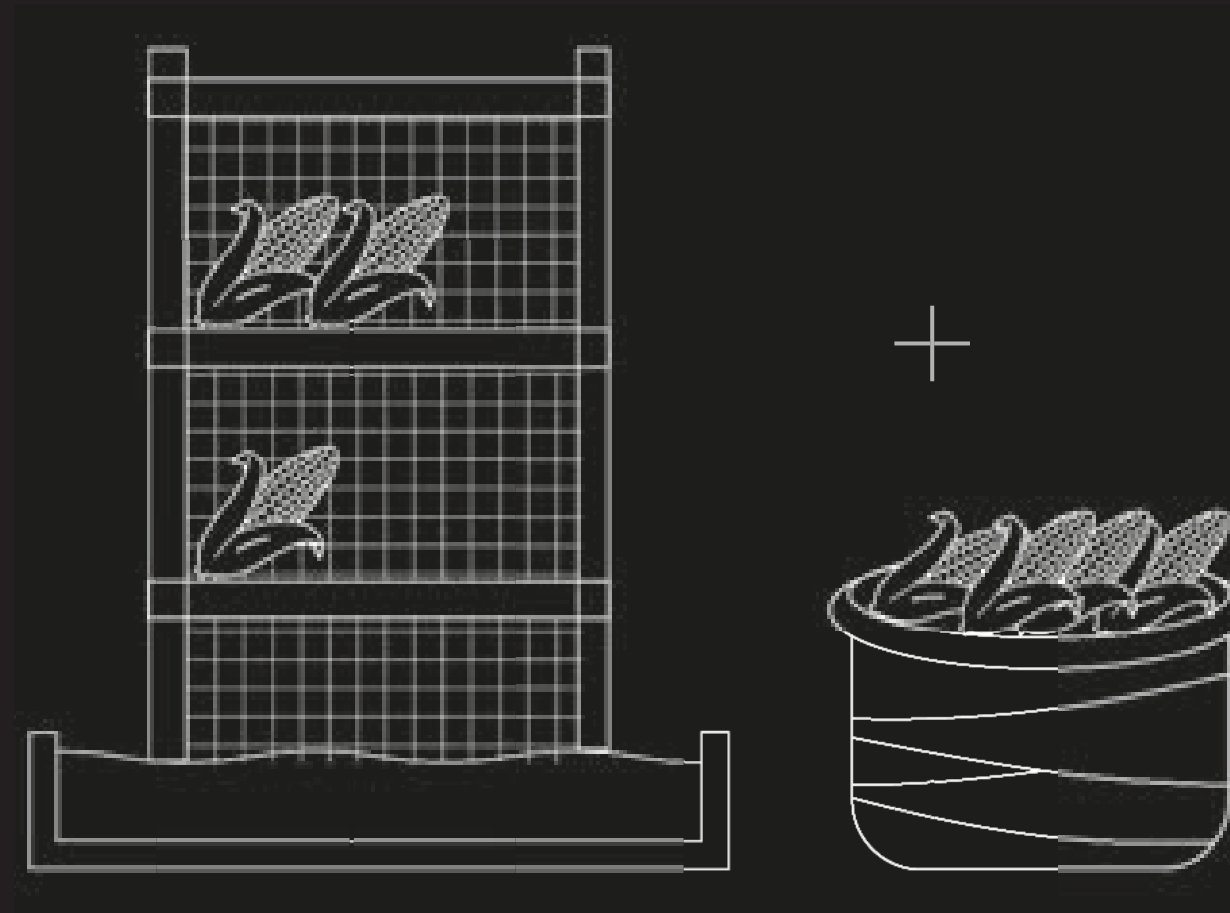
Processing / Separating



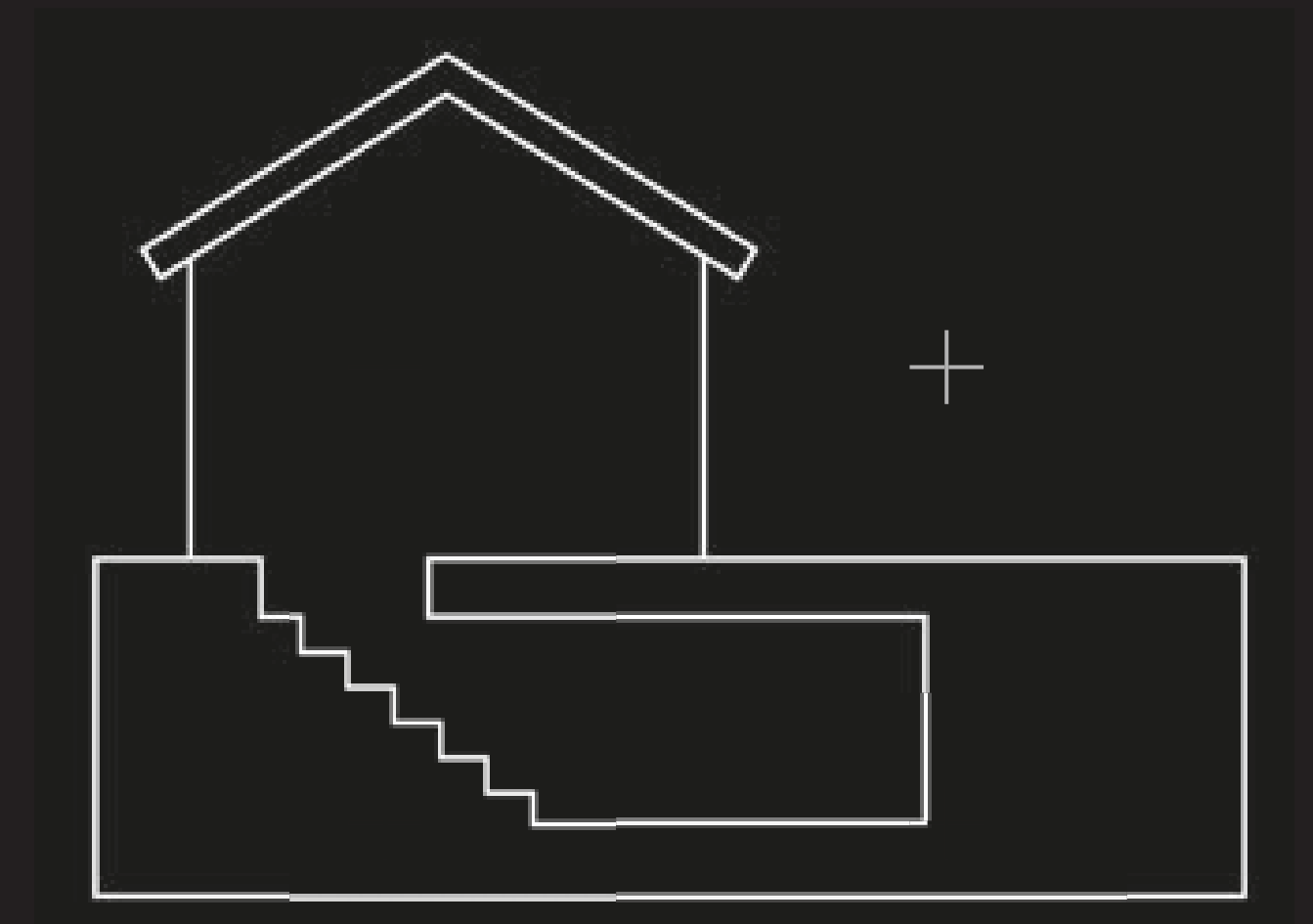
Canning, Brining, Pickling
Up to 1 year



Harvest



Cooling
Maximum 5 to 12 days



Root Cellar